OCHOCO IRRIGATION DISTRICT TELEMETRY CASE STUDY

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ABSTRACT

Ochoco Irrigation District with help from Reclamation's Water Conservation Field Services Program installed three water measurement stations with cell phone telemetry at the tail end of three of their main delivery canals in the spring of 2001. The project was funded to improve the district's water management so they could cope with reduced supplies. In the past the district would send a ditchrider to these locations at the end of the day to record and report the amount of water being spilled each day. This information was then used to calculate the releases needed for delivery the next day along with the incoming water orders. The installation of the water measurement structures and cell phone telemetry enabled the district manager and ditchriders to check on the amount of tailwater at any time during the day. This allowed them to then tweak the deliveries to reduce the amount of tailwater. The implementation of the project was done with a combination of technical and financial assistance from Reclamation and in-kind labor by the district. The timeline was: the idea was explored during the fall of 2000, a grant for financial assistance was done in early winter 2001, the designs for the ramp flumes was done at the same time along with the procuring the telemetry equipment, installation of the flumes and telemetry was done in the spring of 2001. The results of the project were that the district was able to make deliveries for the entire irrigation season in spite of the drought water year and have carryover storage in both Ochoco and Prineville Reservoirs.

INTRODUCTION

The Ochoco Irrigation District (OID) serves 23,840 acres in an area which lies north and west of Prineville Oregon. The water resources of Ochoco Creek and Crooked River furnish irrigation water to OID. The district was organized in 1916 to build a dam on Ochoco Creek. Ochoco Dam was constructed with private capital in 1917-1918, with a usable capacity of 46,500 acre-feet. In 1948 Ochoco Dam rehabilitation was authorized by Congress. The Crooked River Project was authorized by Congress in 1956 for construction of Arthur R. Bowman Dam to provide a supplemental irrigation supply to the district of 70,282 acre-feet. The OID has approximately 97 miles of distribution facilities.

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Before installation of the water measurement stations and telemetry, the district manager would send a ditchrider out to the last measuring stations on the delivery canals at the end of each day to record and report the amount of water being spilled. This information was then used to calculate reservoir releases needed for delivery the next day along with the incoming water orders. This method worked but resulted in a lot of excess water being released and was labor intensive.

DESCRIPTION OF THE PROJECT

The District approached Reclamation as part of the Water Conservation Field Services Program about installing some improved water measurement structures with telemetry. Reclamation personnel visited the District in the fall of 2000 to determine the locations for the water measurement structures and negotiate a cost share agreement. Three tail-end stations were chosen, as these would give the District the largest benefit in terms of water savings and labor. The stations chosen were “the Gap” at the end of the Ochoco Main Canal, “Lytle Creek”, and “Crooked River” at the end of the Crooked River Distribution Canal. Ramp flumes were chosen for the measuring device and cell phones were chosen for the telemetry.

The project was funded to improve the District’s water management. The District wanted to be able to stretch their supply.

IMPLEMENTATION PROCEDURE

Reclamation designed the ramp flumes and specified the telemetry equipment. The District fabricated the ramp flumes and installed them. Once the measurement structures were installed, Reclamation personnel installed the telemetry equipment. The telemetry equipment was programmed and calibrated and OID was instructed in the use of the equipment so they could operate it independently.

Figure 1. Installing pre-fabricated ramp flume at "The Gap."

Figure 2. "The Gap" Stilling well installed. Box and stand for the telemetry equipment installed.

Figure 3. Completed installation of the station at "The Gap."

Figure 4. Ochoco Irrigation District Manager Russ Rhoden checking the installation at "Lytle Creek."

Figure 5. Typical installation of telemetry equipment.

POST-PROJECT EVALUATION AND RESULTS

District patrons had a full season of irrigation (if not a full allotment) and there was carryover storage in Ochoco Reservoir. In previous drought years, the content of Ochoco Reservoir was down to less that 500 acre-feet by September 30. In 2001, the content of Ochoco Reservoir was 8448 acre-feet on September 30.

In comparing pre and post project Ochoco Reservoir hydrographs, there is an approximate 26% reduction of the drawdown rate. For pre-project conditions the overall drawdown rate was 155.94 ac-ft/day from May 21 to September 30. For post-project conditions the overall drawdown rate was 115.38 ac-ft/day from May 8 to September 30.

SUMMARY

Installation of this low-cost water measurement and telemetry equipment has improved OID's water management and resulted in time, cost, labor, and water savings.

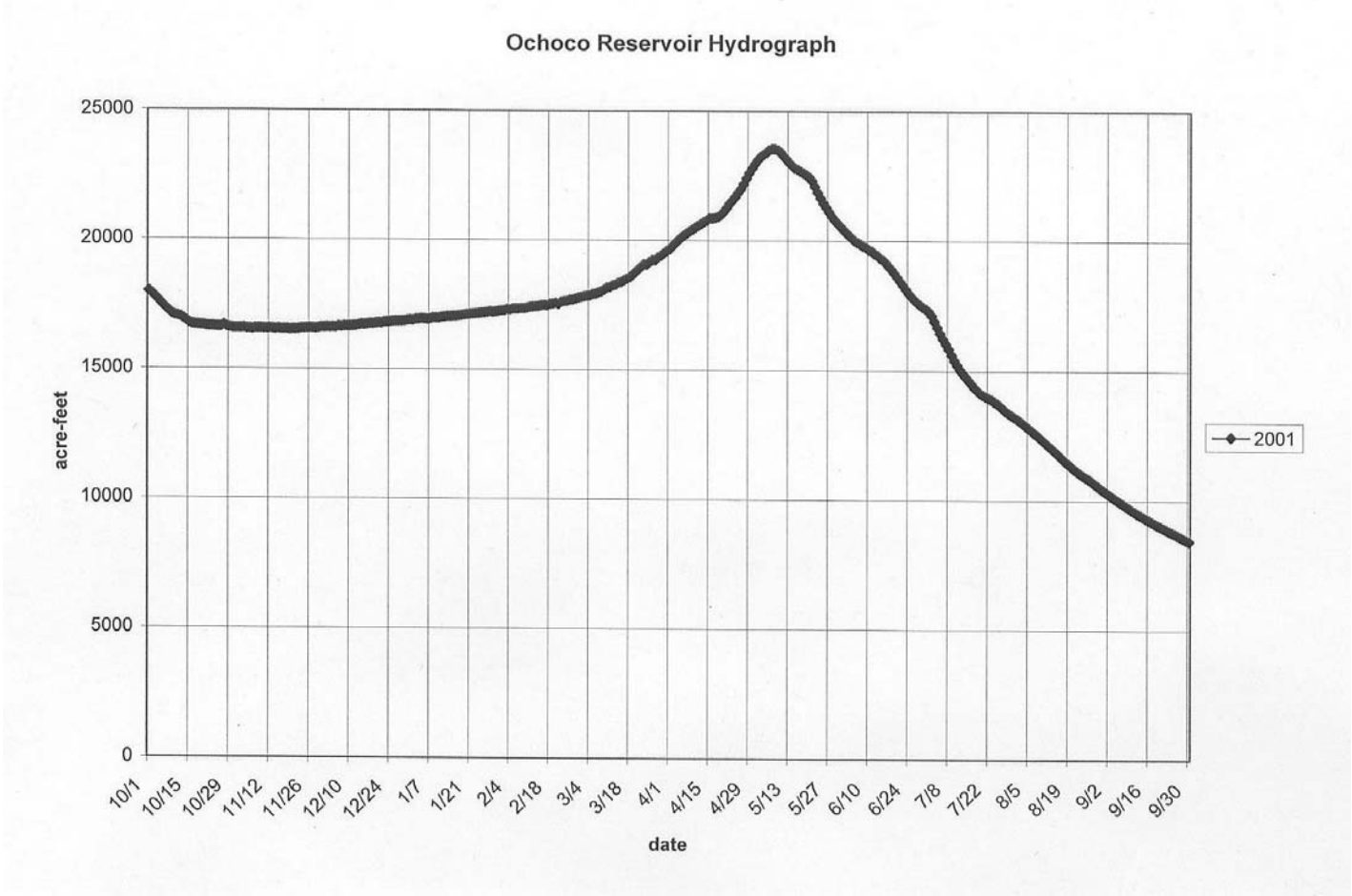

Figure 6. Ochoco Reservoir Hydrograph for water year 2001. The project was installed prior to the irrigation season.

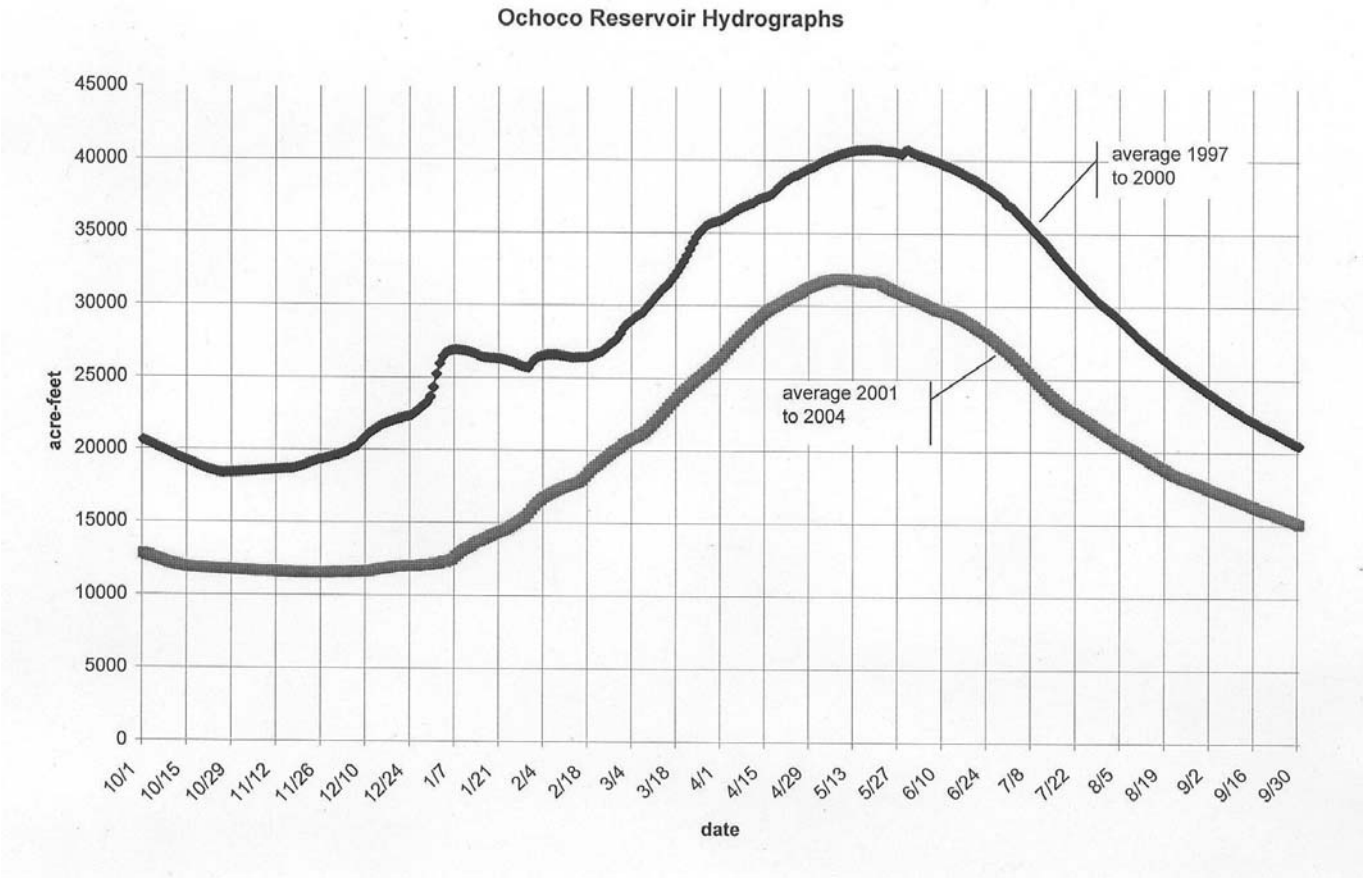

Figure 7. Hydrographs of the averages of water years 1997 to 2000 (pre-project) and of water years 2001 to 2004 (post-project).